



Atty. Dkt. No.046516-0101

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Patrick JUNG et al.
Title: SOLDERED REFRIGERANT CONDENSER
Appl. No.: 10/508,921
Filing Date: September 24, 2004
Examiner: Unknown
Art Unit: Unknown

RENEWED PETITION UNDER 37 C.F.R. § 1.47(a)

Mail Stop: PCT
Commissioner for Patents
Office of PCT Legal Administration
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

As set forth on page 3 of the Decision on Petition Under 37 C.F.R. §1.47(a) dated April 6, 2006, the PTO indicated that Petitioner has satisfied items (1), (3), and (4) of 37 C.F.R. §1.47(a). In this renewed petition in order to supplement the evidence submitted in accordance with item (2) of 37 C.F.R. §1.47(a), Petitioner submits herewith:

1. A Supplemental Declaration by the Person to Whom the Refusal was Made is attached hereto as Appendix A.

Pursuant to 37 C.F.R. § 1.47(a) and MPEP §§ 409.03(a) and 409.03(d), the attached Declaration sets forth facts showing that a bona fide attempt has been made to present the application papers and obtain signatures from Alain Maurer and showing Alain Maurer's effective refusal to execute the application papers.

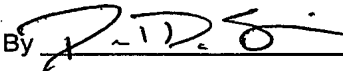
2. A certified translation of the German language letter included in Exhibit 1 accompanying the Declaration by the Person to Whom the Refusal was Made is attached hereto as Appendix B.

3. A petition for extension of time is enclosed herewith to make this renewed petition timely. The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date 10/6/06

FOLEY & LARDNER LLP
Washington Harbour
P.O. Box 25696
3000 K Street N.W., Suite 500
Washington, D.C. 20007-8696
Telephone: (202) 672-5300
Facsimile: (202) 672-5399

By 

Richard L. Schwaab
Attorney for Applicant
Registration No. 25,479

Paul D. Strain
Attorney for Applicant
Registration No. 47,369



APPENDIX A



Atty. Dkt. No. 046516/0101

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Title: SOLDERED REFRIGERANT CONDENSER
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Art Unit: Unknown

DECLARATION BY THE PERSON TO WHOM THE REFUSAL WAS MADE

Mail Stop: PETITIONS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Sir:

I, Fahrija Pilavdzic, state and declare that:

1. I am Secretary to the head of the Intellectual Property Department at Behr GmbH & Co. KG. I have served as Secretary to the head of the Intellectual Property Department at Behr GmbH & Co. KG since 2001. I have been employed by Behr GmbH & Co. KG since 2001.

2. A bona fide attempt has been made to present a copy of the above-captioned patent application and declaration to Mr. Alain Maurer for his review and signature.

Documentary evidence to support this bona fide attempt is as follows:

(a) On June 27, 2006, I sent to Mr. Maurer a letter enclosing three documents, titled (1) "Declaration", (2) "Assignment," and (3) "Soldered Refrigerant Condenser" for his review and signature. A copy of the letter and all enclosures are attached as Exhibit 1.

The letter and enclosures of Exhibit 1 were sent via Deutsche Post, the German Postal Service, to the last known residence address of Mr. Maurer as of June 26, 2006, namely, 8B, rue des fermes, 57520 Grossbliederstorff, FRANCE.

(b) On July 10, 2006, the letter and enclosures of Exhibit 1 were returned to Behr GmbH & Co. KG.

3. From September 8, 2004 to present, with the exception of the return receipts attached as Exhibit 4 and Exhibit 6 to the previously submitted declaration of Ms. Gisela Reusrath, I have not received any communication nor correspondence from Mr. Maurer. To date, Mr. Maurer has not signed and returned a declaration or oath for the above-captioned patent application.

4. Mr. Maurer's employment with Behr GmbH & Co. KG has been terminated.

5. Mr. Maurer's nonresponsiveness since September 8, 2004 supports a conclusion of conduct constituting a refusal to sign the application papers and a refusal to join in the present application.

6. I hereby declare that all statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the above-captioned patent application or any patent issuing thereon.

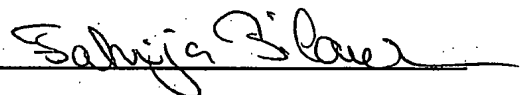
Respectfully submitted,

Date October 6, 2006

Behr GmbH & Co. KG
Mauserstraße 3
70469 Stuttgart
GERMANY

Telephone: +49 711 896 2893
Fax: +49 711 896 3549

By



Fahrja Pilavdzic

Atty. Dkt. No. 046516/0101

EXHIBIT 1

WASH_1701089.1



BEHR

Eingang bei G-IP

10. Juli 2006

Erl.:

Einschreiben/Rückschein

Herrn
Alain Maurer
8B, rue des fermes
57520 GROSSBLIEDERSTORFF
FRANKREICH

Intellectual Property, G-IP
Herr Dr. Grauel
Telefon: +49(0)711 896 2891
Telefax: +49(0)711 896 3549
andreas.grauel@behrgroup.com
27. Juni 2006/FIP

Patentanmeldung in USA: 10/508,921

"Nicht austauschbarer Trockner"

Erfinder: Dr. Gerrit Wölk, Patrick Jung, Sylvain Louis, Alain Maurer, Christian Michels
Unser Zeichen : 01-B-147 WO/US

Sehr geehrter Herr Maurer,

wir nehmen Bezug auf unsere vorangegangene Korrespondenz bezüglich der
Formulare „Declaration/Assignment“ für die Patentanmeldungen in USA, die wir Ihnen
zur Unterschrift übersandt haben.

Beiliegend erhalten Sie nochmals eine Kopie der Anmeldeunterlagen sowie die
Formulare „Declaration/Assignment“ mit der Bitte, diese datiert und unterschrieben an
uns zurückzusenden. Einen adressierten Rückumschlag fügen wir bei.

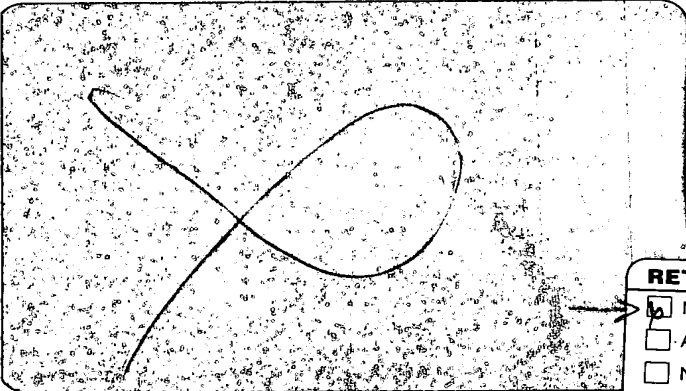
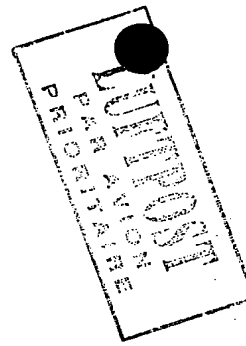
Ihre Unterschrift muss **dringend** beim US-Patentamt nachgereicht werden. Bitte
schicken Sie uns deshalb die unterschriebenen Formulare **schnellstmöglich zurück**.
Vielen Dank im Voraus.

Mit freundlichen Grüßen

BEHR GmbH & Co. KG
Intellectual Property

F. Pilavdzic
(Sekretariat)

Einschreiben
Lettre recommandée
Registered Letter



translation = does not live at the indicated address

RETOUR A L'ENVOYEUR La Poste

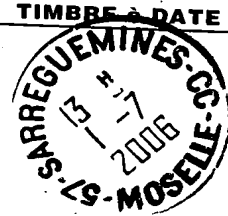
☒ N'habite pas à l'adresse indiquée

☐ Adresse incorrecte ☐ Détérioré

☐ Non réclamé ☐ Non commandé

☐ Refus de paiement ☐ Refusé sans motif

Norm et visa du responsable



Eingang bei G-IP
10. Juli 2006
Erl.:

Deutsche Post

☐ EINSCHREIBEN
EINWURF

☒ EINSCHREIBEN
(Recommandé)

☐ INT. NACHNAHME
(Remboursement)

☐ EIGENHÄNDIG
(A remettre en main propre)

☐ RÜCKSCHEIN
(Avis de réception)

RV 74 042 377 0DE



R

Handwritten mark: a stylized 'M' or 'W' with an arrow pointing to it.

B 912-971-000

R

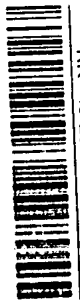
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EINWURF

☒ EINSCHREIBEN
(Recommandé)

☐ INT. NACHNAHME
(Remboursement)

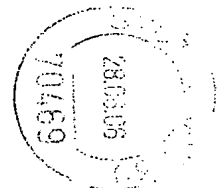
☒ RÜCKSCHEIN
(Avis de réception)

Deutsche Post



RK 48 257 688 90E

Postfach 30 09 20
70449 Stuttgart

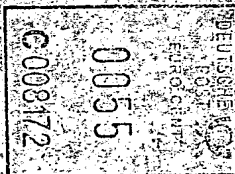
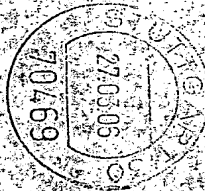


C00672

0835

BEI 111

Postfach 30 09 20
70449 Stuttgart



RÜCKKANTWORT

Behr GmbH & Co. KG
Mauseisstrasse 3

70469 Stuttgart



DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I HEREBY DECLARE:

THAT my residence, post office address, and citizenship are as stated below next to my name;

THAT I believe I am the original, first, and sole inventor (if only one inventor is named below) or an original, first, and joint inventor (if plural inventors are named below or in an attached Declaration) of the subject matter which is claimed and for which a patent is sought on the invention entitled

SOLDERED REFRIGERANT CONDENSER

(Attorney Docket No. 046516-0101)

the specification of which (check one)

 is attached hereto.

 X was filed on March 14, 2003 as United States Application Number or PCT International Application Number PCT/EP03/02662 and was amended on _____ (if applicable).

THAT I do not know and do not believe that the same invention was ever known or used by others in the United States of America, or was patented or described in any printed publication in any country, before I (we) invented it;

THAT I do not know and do not believe that the same invention was patented or described in any printed publication in any country, or in public use or on sale in the United States of America, for more than one year prior to the filing date of this United States application;

THAT I do not know and do not believe that the same invention was first patented or made the subject of an inventor's certificate that issued in any country foreign to the United States of America before the filing date of this United States application if the foreign application was filed by me (us), or by my (our) legal representatives or assigns, more than twelve months (six months for design patents) prior to the filing date of this United States application;

THAT I have reviewed and understand the contents of the above-identified specification, including the claim(s), as amended by any amendment specifically referred to above;

THAT I believe that the above-identified specification contains a written description of the invention, and of the manner and process of making and using it, in such full, clear,

concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention, and sets forth the best mode contemplated by me of carrying out the invention; and

THAT I acknowledge the duty to disclose to the U.S. Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I HEREBY CLAIM foreign priority benefits under Title 35, United States Code §119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number	Country	Foreign Filing Date	Priority Claimed?	Certified Copy Attached?
102 13 194.5	Federal Republic of Germany	25 March 2002	YES	

I HEREBY CLAIM the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below.

U.S. Provisional Application Number	Filing Date

I HEREBY CLAIM the benefit under Title 35, United States Code, §120 of any United States application(s), or § 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application Number	PCT Parent Application Number	Parent Filing Date	Parent Patent Number

I HEREBY APPOINT the registered attorneys and agents at Customer Number

22428

to have full power to prosecute this application and any continuations, divisions, reissues, and reexaminations thereof, to receive the patent, and to transact all business in the United States Patent and Trademark Office connected therewith.

I request that all correspondence be directed to:

Richard L. Schwaab
FOLEY & LARDNER LLP
Customer Number: 22428

Telephone: (202) 672-5414
Facsimile: (202) 672-5399

I UNDERSTAND AND AGREE THAT the foregoing attorneys and agents appointed by me to prosecute this application do not personally represent me or my legal interests, but instead represent the interests of the legal owner(s) of the invention described in this application.

I FURTHER DECLARE THAT all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Name of first inventor Patrick JUNG

Residence Roth, France

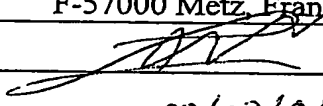
Citizenship France

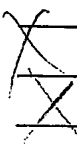

Post Office Address 10, impasse des Jonquilles
F-57910 Roth, France

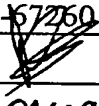
Inventor's signature

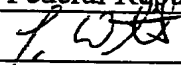
Date


2/9/04

Name of second inventor Sylvain LOUIS
 Residence Metz, France
 Citizenship France
 Post Office Address 31, rue des Jardiniers
 F-57000 Metz, France
 Inventor's signature 
 Date 02/03/05

Name of third inventor Alain MAURER
 Residence Weislingen, France
 Citizenship France
 Post Office Address 5, impasse de l'Eglise
 F-67290 Weislingen, France
 Inventor's signature 
 Date 

Name of fourth inventor Christian MICHELS
 Residence Kaskatel, France
 Citizenship France
 Post Office Address 20, rue de Lorraine
 F-67260 Kaskatel, France
 Inventor's signature 
 Date 02/09/04

Name of fifth inventor Gerrit WÖLK
 Residence Stuttgart, Federal Republic of Germany
 Citizenship Federal Republic of Germany
 Post Office Address Olgastrasse 126
 D-70180 Stuttgart
 Federal Republic of Germany
 Inventor's signature 
 Date 15.09.04



**Declaration and Power of Attorney For Patent Application
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration**

Nachstehend benannter Erfinder erkläre ich hiermit an
Eides Statt:

As a below named inventor, I hereby declare that:

dass mein Wohnsitz, meine Postanschrift, und meine
Staatsangehörigkeit den im Nachstehenden nach meinem
Namen aufgeführten Angaben entsprechen,

My residence, post office address and citizenship are as sta
below next to my name,

Dass ich, nach bestem Wissen der ursprüngliche, erste und
alleinige Erfinder (falls nachstehend nur ein Name angegeben
ist) oder ein ursprünglicher, erster und Miterfinder (falls
nachstehend mehrere Namen aufgeführt sind) des
Gegenstandes bin, für den dieser Antrag gestellt wird und für
den ein Patent beantragt wird für die Erfindung mit dem Titel:

I believe I am the original, first and sole inventor (if only o
name is listed below) or an original, first and joint inventor
plural names are listed below) of the subject matter which
claimed and for which a patent is sought on the invention
entitled

SOLDERED REFRIGERANT CONDENSER

SOLDERED REFRIGERANT CONDENSER

Deren Beschreibung

the specification of which

(zutreffendes ankreuzen)

(check one)

☐ hier beigefügt ist.

☐ is attached hereto.

☒ am March 14, 2003 unter der

☒ was filed on March 14, 2003 as

Anmeldungsseriennummer PCT/EP03/02662

Application Serial No. PCT/EP03/02662

eingereicht wurde und am abgeändert wurde

and was amended on _____
(if applicable).

_____ (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen
Patentanmeldung einschliesslich der Ansprüche durchgesehen
und verstanden habe, die eventuell durch einen Zusatzantrag
wie oben erwähnt abgeändert wurde.

I hereby state that I have reviewed and understand the
contents of the above identified specification, including the
claims, as amended by any amendment referred to above.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher
Informationen, die für die Prüfung der vorliegenden
Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch,
Paragraph 1.56(a) von Wichtigkeit sind, an.

I acknowledge the duty to disclose information which is
material to the examination of this application in accordance
with Title 37, Code of Federal Regulations, §1.56(a).

Ich beanspruche hiermit ausländische Prioritätsvorteile
gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten
Staaten, Paragraph 119 aller unten angegebenen
Auslandsanmeldungen für ein Patent oder eine
Erfindersurkunde, und habe auch alle Auslandsanmeldungen
für ein Patent oder eine Erfindersurkunde nachstehend
gekennzeichnet, die ein Anmeldedatum haben, das vor dem
Anmeldedatum der Anmeldung liegt, für die Priorität
beansprucht wird.

I hereby claim foreign priority benefits under Title 35, Uni
States Code, §119 of any foreign application(s) for patent c
inventor's certificate listed below and have also identified
below any foreign application for patent or inventor's
certificate having a filing date before that of the application
which priority is claimed:

Declaration and Power of Attorney For Patent Application
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration

Prior foreign applications
Priorität beansprucht

Priority Claimed

102 13 194.5
 (Number)
 (Nummer)

Federal Republic of Germany
 (Country)
 (Land)

25 March 2002
 (Day/Month/Year Filed)
 (Tag/Monat/Jahr eingereicht)

☒ ☐
 Yes No
 Ja Nein

 (Number)
 (Nummer)

 (Country)
 (Land)

 (Day/Month/Year Filed)
 (Tag/Monat/Jahr eingereicht)

☐ ☐
 Yes No
 Ja Nein

 (Number)
 (Nummer)

 (Country)
 (Land)

 (Day/Month/Year Filed)
 (Tag/Monat/Jahr eingereicht)

☐ ☐
 Yes No
 Ja Nein

Ich beanspruche hiermit Prioritätsvorteile unter Title 35, US-Code, § 119(e) aller US-Hilfsanmeldungen wie unten aufgezählt.

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

 (Application Serial No.)
 (Anmeldeseriennummer)

 (Filing Date)
 (Anmeldedatum)

 (Application Serial No.)
 (Anmeldeseriennummer)

 (Filing Date)
 (Anmeldedatum)

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 112 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

 (Application Serial No.)
 (Anmeldeseriennummer)

 (Filing Date)
 (Anmeldedatum)

 (Status)
 (patentiert, anhängig,
 aufgegeben)

 (Status)
 (patented, pending,
 abandoned)

 (Application Serial No.)
 (Anmeldeseriennummer)

 (Filing Date)
 (Anmeldedatum)

 (Status)
 (patentiert, anhängig,
 aufgegeben)

 (Status)
 (patented, pending,
 abandoned)

Ich erkläre hiermit, dass alle von mir in der vorliegenden Erklärung gemachten Angaben nach meinem besten Wissen und Gewissen der vollen Wahrheit entsprechen, und dass ich diese eidesstattliche Erklärung in Kenntnis dessen abgebe, dass wissentlich und vorsätzlich falsche Angaben gemäss Paragraph 1001, Absatz 18 der Zivilprozessordnung der Vereinigten Staaten von Amerika mit Geldstrafe belegt und/oder Gefängnis bestraft werden können, und dass

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issue

Declaration and Power of Attorney For Patent Application
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration

derartig wissentlich und vorsätzlich falsche Angaben die
Gültigkeit der vorliegenden Patentanmeldung oder eines
darauf erteilten Patentes gefährden können.

thereon.

VERTRETUNGSVOLLMACHT: Als benannter Erfinder
beauftrage ich hiermit den nachstehend benannten
Patentanwalt (oder die nachstehend benannten
Patentanwälte) und/oder Patent-Agenten mit der Verfolgung
der vorliegenden Patentanmeldung sowie mit der
Abwicklung aller damit verbundenen Geschäfte vor dem
Patent- und Warenzeichenamt: *(Name und*

Registrationnummer anführen): **CUSTOMER NO. 22428**

Pavan K. Agarwal, Reg. No. 40,888; George C. Beck, Reg. No. 38,072; Stephen A. Bent, Reg. No. 29,768; David A. Blumenthal, Reg. No. 26,257; Beth A. Burrous, Reg. No. 35,087; Alan I. Cantor, Reg. No. 28,163; William T. Ellis, Reg. No. 26,874; John J. Feldhaus, Reg. No. 28,822; Michael D. Kaminski, Reg. No. 32,094; Mary Michelle Kile, Reg. No. 35,217; Kenneth E. Krosin, Reg. No. 25,735; Glenn Law, Reg. No. 34,371; Peter G. Mack, Reg. No. 26,001; Stephen B. Maebius, Reg. No. 35,264; Brian J. McNamara, Reg. No. 32,789; Richard C. Peet, Reg. No. 35,792; George E. Quillin, Reg. No. 32,792; Andrew E. Rawlins, Reg. No. 34,702; Bernhard D. Saxe, Reg. No. 28,665; Richard L. Schwaab, Reg. No. 25,479; Michele M. Simkin, Reg. No. 34,717; Harold C. Wegner, Reg. No. 25,258.

Telefongesprache bitte richten an:

(Name und Telefonnummer)

RICHARD L. SCHWAAB (202) 672-5300

CUSTOMER NO. 22428

Postanschrift: **FOLEY & LARDNER LLP**
3000 K Street, N.W., Suite 500
Washington, D.C. 20007-5109
CUSTOMER NO. 22428

POWER OF ATTORNEY: As a named inventor, I hereby
appoint the following attorney(s) and/or agent(s) to prosecute
this application and transact all business in the Patent and
Trademark Office connected therewith. *(List name and*

registration number): **CUSTOMER NO. 22428**

Pavan K. Agarwal, Reg. No. 40,888; George C. Beck, Reg. No. 38,072; Stephen A. Bent, Reg. No. 29,768; David A. Blumenthal, Reg. No. 26,257; Beth A. Burrous, Reg. No. 35,087; Alan I. Cantor, Reg. No. 28,163; William T. Ellis, Reg. No. 26,874; John J. Feldhaus, Reg. No. 28,822; Michael D. Kaminski, Reg. No. 32,094; Mary Michelle Kile, Reg. No. 35,217; Kenneth E. Krosin, Reg. No. 25,735; Glenn Law, Reg. No. 34,371; G. Mack, Reg. No. 26,001; Stephen B. Maebius, Reg. No. 35,264; Brian J. McNamara, Reg. No. 32,789; Richard C. Peet, Reg. No. 35,792; George E. Quillin, Reg. No. 32,792; Andrew E. Rawlins, Reg. No. 34,702; Bernhard D. Saxe, Reg. No. 28,665; Richard L. Schwaab, Reg. No. 25,479; Michele M. Simkin, Reg. No. 34,717; Harold C. Wegner, Reg. No. 25,258.


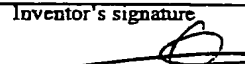
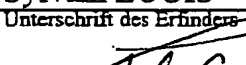
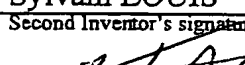
Direct Telephone calls to:

(Name and telephone number)

RICHARD L. SCHWAAB (202) 672-5300

CUSTOMER NO. 22428







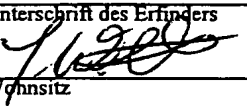
Send Correspondence to: **FOLEY & LARDNER LLP**
3000 K Street, N.W., Suite 500
Washington, D.C. 20007-5109
CUSTOMER NO. 22428

Voller Name des einzigen oder ursprünglichen Erfinders:		Full name of sole or first inventor:	
Patrick JUNG		Patrick JUNG	
Unterschrift des Erfinders	Datum	Inventor's signature	Date
	2/3/04		2/3/04
Wohnsitz		Residence	
Roth, France		Roth, France	
Staatsangehörigkeit		Citizenship	
France		France	
Postanschrift		Post Office Address	
10, impasse des Jonquilles F-57910 Roth, France		10, impasse des Jonquilles F-57910 Roth, France	
Voller Name des zweiten Miterfinders (falls zutreffend)		Full name of second joint inventor, if any	
Sylvain LOUIS		Sylvain LOUIS	
Unterschrift des Erfinders	Datum	Second Inventor's signature	Date
	02/03/05		02/03/05
Wohnsitz		Residence	
Metz, France		Metz, France	
Staatsangehörigkeit		Citizenship	
France		France	
Postanschrift		Post Office Address	
31, rue des Jardiniers F-57000 Metz, France		31, rue des Jardiniers F-57000 Metz, France	

(Bitte entsprechende Informationen und Unterschriften im
Falle von dritten und weiteren Miterfindern angeben.)

(Supply similar information and signature for third and
subsequent joint inventors.)

Declaration and Power of Attorney For Patent Application
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration

Voller Name des dritter miterfinders (falls zutreffend):		Full name of third joint inventor, if any:	
Alain MAURER		Alain MAURER	
Unterschrift des Erfinders	Datum	Third inventor's signature	Date
			
Wohnsitz		Residence	
Weislingen, France		Weislingen, France	
Staatsangehörigkeit		Citizenship	
France		France	
Postanschrift		Post Office Address	
5, impasse de l'Eglise F-67290 Weislingen, France		5, impasse de l'Eglise F-67290 Weislingen, France	
Voller Name des vierter miterfinders (falls zutreffend):		Full name of fourth joint inventor, if any:	
Christian MICHELS		Christian MICHELS	
Unterschrift des Erfinders	Datum	Fourth inventor's signature	Date
	02.10.09		02.10.09
Wohnsitz		Residence	
Kaskatel, France		Kaskatel, France	
Staatsangehörigkeit		Citizenship	
France		France	
Postanschrift		Post Office Address	
20, rue de Lorraine F-67260 Kaskatel, France		20, rue de Lorraine F-67260 Kaskatel, France	
Voller Name des fünfter miterfinders (falls zutreffend):		Full name of fifth joint inventor, if any:	
Gerrit WÖLK		Gerrit WÖLK	
Unterschrift des Erfinders	Datum	Fifth inventor's signature	Date
	15.09.09		
Wohnsitz		Residence	
Stuttgart, Federal Republic of Germany		Stuttgart, Federal Republic of Germany	
Staatsangehörigkeit		Citizenship	
Federal Republic of Germany		Federal Republic of Germany	
Postanschrift		Post Office Address	
Olgastrasse 126, D-70180 Stuttgart Federal Republic of Germany		Olgastrasse 126, D-70180 Stuttgart Federal Republic of Germany	
Voller Name des sechster miterfinders (falls zutreffend):		Full name of sixth joint inventor, if any:	
Unterschrift des Erfinders	Datum	Sixth inventor's signature	Date
Wohnsitz		Residence	
Staatsangehörigkeit		Citizenship	
Postanschrift		Post Office Address	

ASSIGNMENT

For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged each undersigned inventor has sold and assigned, and by these presents hereby sells and assigns, unto

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<i>address of</i>	<i>Mauserstrasse 3</i>	<i>Europôle</i>
<i>assignee</i>	<i>D-70469 Stuttgart</i>	<i>F-57910 Hambach, France</i>
	<i>Federal Republic of Germany</i>	

(hereinafter ASSIGNEE) all right, title and interest for the United States, its territories and possessions in and to this invention relating to

title of *SOLDERED REFRIGERANT CONDENSER*
invention

as set forth in this United States Patent Application

check one ☐ executed concurrently herewith
☐ executed on _____
☒ Serial No. PCT/EP03/02662 Filed March 14, 2003



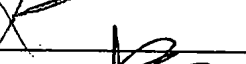


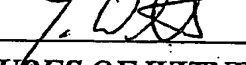
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Each of the undersigned further covenants and agrees he will communicate to said ASSIGNEE, its successors, legal representatives or assigns all information known to him relating to said invention or patent application and that he will execute and deliver any papers, make all rightful oaths, testify in any legal proceedings and perform all other lawful acts deemed necessary or desirable by said ASSIGNEE, its successors, legal representatives or assigns to perfect title to said invention, to said application including divisions and continuations thereof and to any and all Letters Patent which may be granted therefor or thereon, including reissues or extensions, in said ASSIGNEE, its successors, or assigns or to assist said ASSIGNEE, its successors, legal representatives or assigns in obtaining, reissuing or enforcing Letters Patent of the United States for said invention;

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<i>NAMES AND SIGNATURES OF INVENTORS</i>		
Name: Patrick JUNG	Signature: 	Date: 2/8/04
Name: Sylvain LOUIS	Signature: 	Date: 02/13/05
Name: Alain MAURER	Signature: 	Date: 
Name: Christian MICHELS	Signature: 	Date: 02/09/04
Name: Gerrit WÖLK	Signature: 	Date: 15.09.04
<i>NAMES AND SIGNATURES OF WITNESSES</i>		
Name:	Signature:	Date:
Name:	Signature:	Date:

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Soldered refrigerant condenser

The invention relates to a soldered refrigerant condenser which consists of a heat exchanger network with flat tubes and corrugated ribs, of collecting tubes which are fluid-connected to the flat tubes and of a header which is arranged parallel to one of the connecting tubes and which receives within it a dryer and/or a filter and is fluid-connected to the collecting tube via two overflow orifices, a condenser of this type being known from the Applicant's EP 0 669 506 A1.

This known condenser is what is known as a condenser module, in which is arranged, parallel to one of the collecting tubes, a header which is fluid-connected to the collecting tube via two overflow orifices. The refrigerant can thereby flow out of the collecting tube into the header where a dryer is located, that is to say a container, usually made from plastic, which is filled with a dryer granulate for the dehydration of refrigerant. After the refrigerant has flowed around or through the dryer, it passes through a filter sieve into the lower region of the header. The sieve has the task of removing impurities in the form of very fine particles from the refrigerant. The refrigerant thereafter enters the collecting tube of the condenser again via the lower overflow orifice. In this type of construction, all the metal parts, that is to say flat tubes, ribs, collecting tubes and header, are hard-soldered in a soldering furnace, that is to say at a temperature of about 620°C. The plastic insert having the granulate does not withstand temperatures of this kind, and it is therefore inserted only after soldering into the header which is subsequently closed by means of a cover. The insert with dryer granulate can then also be exchanged for maintenance purposes.

Similar types of construction with an inserted or exchangeable dryer cartridge which is also integrated with a filter sieve as an installation part may be gathered from further publications of the Applicant, EP 0 689 041 B1 and EP 0 867 670 A2. Furthermore, condenser modules have also become known, which are only a dryer insert with granulate, that is to say without a filter sieve, that is to say the Applicant's EP 0 668 986 B1 and DE 43 19 293 C2. All these types of construction have in common the fact that the dryer insert with or without a filter sieve is mounted, that is to say positioned in the header, only after the process of soldering the condenser. After this introduction of the dryer/filter insert, the header has to be closed in a fluidtight and pressuretight manner. This requires, on the one hand, corresponding structural measures in the form of an orifice on the header with a fitting cover and, on the other hand, additional work steps after soldering for mounting the dryer insert. This, of course, entails corresponding costs which are reflected in the price of the condenser module.

The object of the present invention is to improve a refrigerant condenser of the type initially mentioned, to the effect that the mounting of the dryer/filter insert can be simplified and the production costs of the entire condenser can be reduced.

This object is achieved by means of the features of patent claim 1. In the first place, one advantage which arises is that both the dryer and the filter are mounted even before the final soldering process, so that the condenser is already complete after soldering, that is to say the dryer and the filter do not have to

be mounted subsequently. A further advantage arises due to the fact that the dryer does not constitute an additional part to be mounted as a structural unit, but, instead, is integrated into the header in such a way that a portion of the header itself forms part of the dryer. This saves weight and costs. This applies, in principle, to all types of header construction according to the prior art known, for example, from DE-A 42 38 853, that is to say headers produced from tubes, tubular parts or extruded profiles.

According to an advantageous development of the invention, that portion of the header which forms the dryer and receives the dryer medium is closed off at the top and bottom by means of a perforated plate. Consequently, ingress of the refrigerant from both sides or a passage of the refrigerant through the dryer region in both directions is possible.

In a further advantageous refinement of the invention, a felt layer is arranged between the lower perforated plate and the dryer medium (granulate), thus preventing a pronounced abrasion of the granulate and suppressing a possible abrasion of the granulate.

In a further advantageous refinement of the invention, the granulate is compressed via a spring-loaded pressure plate, with the result that abrasion due to shaking movements is likewise avoided.

In a further advantageous refinement of the invention, the closing plates may be connected frictionally, positively or materially integrally to the inner wall of the header, thus allowing a firm connection either before or during the soldering process.

In a further advantageous refinement of the invention, the header is widened in its cross section in the portion between the closing plates, that is to say it forms in each case, with respect to the adjacent header regions, a step, into which the closing plates can be positioned and fastened positively or frictionally. Furthermore, owing to this cross-sectional widening, a larger quantity of granulate can be received or the height of the dryer portion can be reduced, thus increasing the efficiency of the drying operation.

In a further advantageous refinement of the invention, the upper closing plate is formed by the closure of the header, that is to say the drying portion is located in the uppermost region of the header. The dryer is consequently further simplified, since further parts and work operations are dispensed with.

According to a further advantageous refinement of the invention, the filter is located in the lower region of the header between the overflow orifices, that is to say it is separated spatially from the dryer. The refrigerant flowing through the upper overflow orifice into the header therefore flows into the filter directly, without flowing through the dryer. This reduces the pressure drop of the refrigerant which flows with its entire volume flow through the header. The drying of the refrigerant is nevertheless ensured, since the refrigerant located in the header, even in its vaporous phase, comes into sufficient contact with the dryer granulate. The filter sieve, too, can readily be positioned and fastened in the header before the soldering process, for example by means of a clamping fit. In addition to the types of connection already mentioned, adhesive bonding or soldering both of the filter insert and of the closing plates for the dryer

portion is also possible.

An exemplary embodiment of the invention is illustrated in the drawing and is described in more detail below.

5 In the drawing:

fig. 1 shows a header/collecting tube unit,

fig. 2 shows the unit according to fig. 1 in an exploded illustration, and

10 fig. 3 shows a section through the header with dryer and filter.

Fig. 1 shows a header 1, consisting of a tubular portion 2 and of an extruded portion 3, and a collecting tube 4 with rim holes 5 for flat tubes, not
15 illustrated, of a refrigerant condenser. The header 1 and collecting tube 4 form an integrated unit of a condenser module initially mentioned.

Fig. 2 shows the unit according to fig. 1 in two
20 illustrations: the upper part shows the unit according to fig. 1 in the assembled state; and the lower part shows the header 1 and the collecting tube 4 as separate components, that is to say before their assembly. The tubular portion 2 is inserted into the
25 extruded portion 3 and is soldered to the latter. The extruded portion 3 has two overflow orifices 5 which are assigned two rim holes 6 on the collecting tube 4. The more particular construction and assembly of the header 1 and of the collecting tube 4 are described in
30 more detail in the Applicant's older patent application bearing the file number 101 54 891.

Fig. 3 shows the design according to the invention of a
35 header 10 which corresponds in its type of construction to the header 1 in conjunction with the collecting tube 4 according to fig. 1 and 2. The header 10 is composed

of a tubular piece 11 of smaller wall thickness and an
extruded tubular piece 12 of larger wall thickness. The
lower tubular piece 12 has an upper overflow orifice
13, that is to say an inflow orifice, and a lower
5 overflow orifice 14, that is to say an outflow orifice.
The upper tubular piece 11 is inserted into the lower
tubular piece 12 and is connected to the latter in the
region of the joining point 15 by soldering. The two
tubular pieces 11 and 12 are closed off in a
10 pressure-tight manner, likewise by soldering, at their
ends located opposite one another, in each case by
means of closing covers 16, 17. The tubular piece 11,
which is produced from a welded tube, has a portion 18
of widened cross section which has adjoining it on both
15 sides portions 19 and 20 with an equal smaller cross
section. Such a cross-sectional widening can be
produced by the expansion of the tube 11, for example
by internal high pressure forming (IHF) or what is
known as hydroforming. This cross-sectional widening in
20 the region of the portion 18 results in steps 21 and 22
in the profile of the tube 11. In the region of these
steps 21, 22 perforated disks 23 and 24, that is to say
disks with passage orifices 25 and 26 which are
distributed in a multiplicity over the entire cross
25 section, are inserted into the interior of the tubular
portion 18. Above the lower perforated disk 23 is
arranged a felt layer 27, above which a dryer medium in
the form of granulate 28 is located in a dense packing.
This dryer granulate 28 is resistant to high
30 temperature, that is to say it does not undergo any
impairment during the soldering process. Above the
uppermost layer of the granulate 28 is arranged a
pressure plate 29 which is supported on the lower
surface of the perforated plate 24 via a compression
35 spring 30. This ensures that the packing of the
granulate 28 is compressed and does not slip out of

place and therefore no abrasion occurs.

5 The two perforated disks 23, 24 are supported, on the one hand, with their edges, in the region of the transitions 21, 22, positively and frictionally with respect to the wall of the tubular piece 11. In addition, during the final soldering process, they are soldered to the tubular piece 11, so that they form an unreleasable connection with the tube 11.

10 Alternatively, adhesive bonding of the perforated plates 23, 24 to the tubular piece 11 may also be provided. In the lower region of the header 10, that is to say in the extruded tubular piece 12 and between the two overflow orifices 13, 14, is arranged a filter

15 sieve 31 which is of cup-shaped design and has a bottom 32 and an annular edge region 33. The latter is inserted in an annular groove 34 in the tubular piece 12 and is anchored there. Premounting before soldering is therefore carried out by insertion of the edge 33

20 into the groove 34, and final firm materially integral connection takes place during the concluding process of soldering the condenser.

25 According to a variant, not illustrated, the filter sieve may also be of annular design.

30 The functions of drying, on the one hand, and of filtration, on the other hand, are separated spatially here, that is to say drying takes place in the upper region of the header 10, whereas filtration takes place in the lower region. As is known from the prior art initially mentioned, the refrigerant passes through the inflow orifice 13, following the arrow E, into the interior of the header 10, flows through the filter

35 sieve 31 of cup-like design and leaves the header via the outflow orifice 14, following the arrow A. This

results in a relatively minor pressure drop for the refrigerant which flows through the header 10, since the refrigerant does not have to flow through the dryer, as it does in the prior art. Drying takes place
5 in that refrigerant vapor and/or refrigerant liquid which pass into the upper region of the header 10 come into contact with the dryer granulate 28 there and are thus dehumidified. In the upper region of the header 10, that is to say above the inflow orifice 13,
10 therefore, a secondary flow of the refrigerant is formed, which leads first to the dryer granulate 28 and from there, dehumidified, flows back in the direction of the filter sieve 31. The two functions of drying and of filtration are consequently ensured.

15

As already mentioned above, the invention can also be implemented with other forms of header construction, for example in the case of a continuous extruded header profile.

Patent Claims

1. A soldered refrigerant condenser, consisting of a heat exchanger network with flat tubes and corrugated
5 ribs, of collecting tubes which are fluid-connected to the flat tubes, and of a header (10) which is arranged parallel to one of the collecting tubes and which receives within it a dryer and/or filter and is fluid-
10 connected to the collecting tube via overflow orifices (13, 14), **characterized** in that the dryer is formed by a space which receives a dryer medium (28) and which is delimited by a portion (18) of the header (10, 11) and two closing plates (23, 24) passing through the cross
15 section of the header (10, 11).
2. The condenser as claimed in claim 1, **characterized** in that at least one of the closing plates is designed as a perforated plate (23, 24).
- 20 3. The condenser as claimed in claim 1 or 2, **characterized** in that the portion (18) of the header (10, 11) is widened in its cross section with respect to the adjacent regions (19, 20).
- 25 4. The condenser as claimed in claim 3, **characterized** in that the header (10) is designed as a tube (11) and the widened portion (18) is produced by expansion.
- 30 5. The condenser as claimed in one of claims 1 to 4, **characterized** in that a felt layer (27) is arranged between the lower perforated plate (23) and the granulate (28).
- 35 6. The condenser as claimed in one of claims 1 to 5, **characterized** in that an elastically prestressed pressure plate (29) is arranged between the upper

closing plate (24) and the granulate (28).

7. The condenser as claimed in one of claims 1 to 6,
characterized in that the closing plates (23, 24) form
5 a firm connection with the wall (21, 22) of the header
(10).

8. The condenser as claimed in claim 7, **characterized**
in that the connection is frictional.
10

9. The condenser as claimed in claim 7 or 8,
characterized in that the connection is positive.

10. The condenser as claimed in claim 7, 8 or 9,
15 **characterized** in that the connection is materially
integral.

11. The condenser as claimed in one of the preceding
claims, **characterized** in that the upper closing plate
20 is designed as a closure (16) of the header (10).

12. The condenser as claimed in one of claims 1 to 10,
characterized in that the portion (18) containing the
dryer granulate (28) is arranged in the upper region of
25 the header (10), preferably in the upper third, in
relation to the total height H of the header (10).

13. The condenser as claimed in one of claims 1 to 12,
characterized in that the filter (31) is arranged in
30 the lower region of the header (10) between the two
overflow orifices (13, 14).

14. The condenser as claimed in claim 13,
characterized in that the filter (31) is designed as a
35 cup-shaped close-mesh sieve.

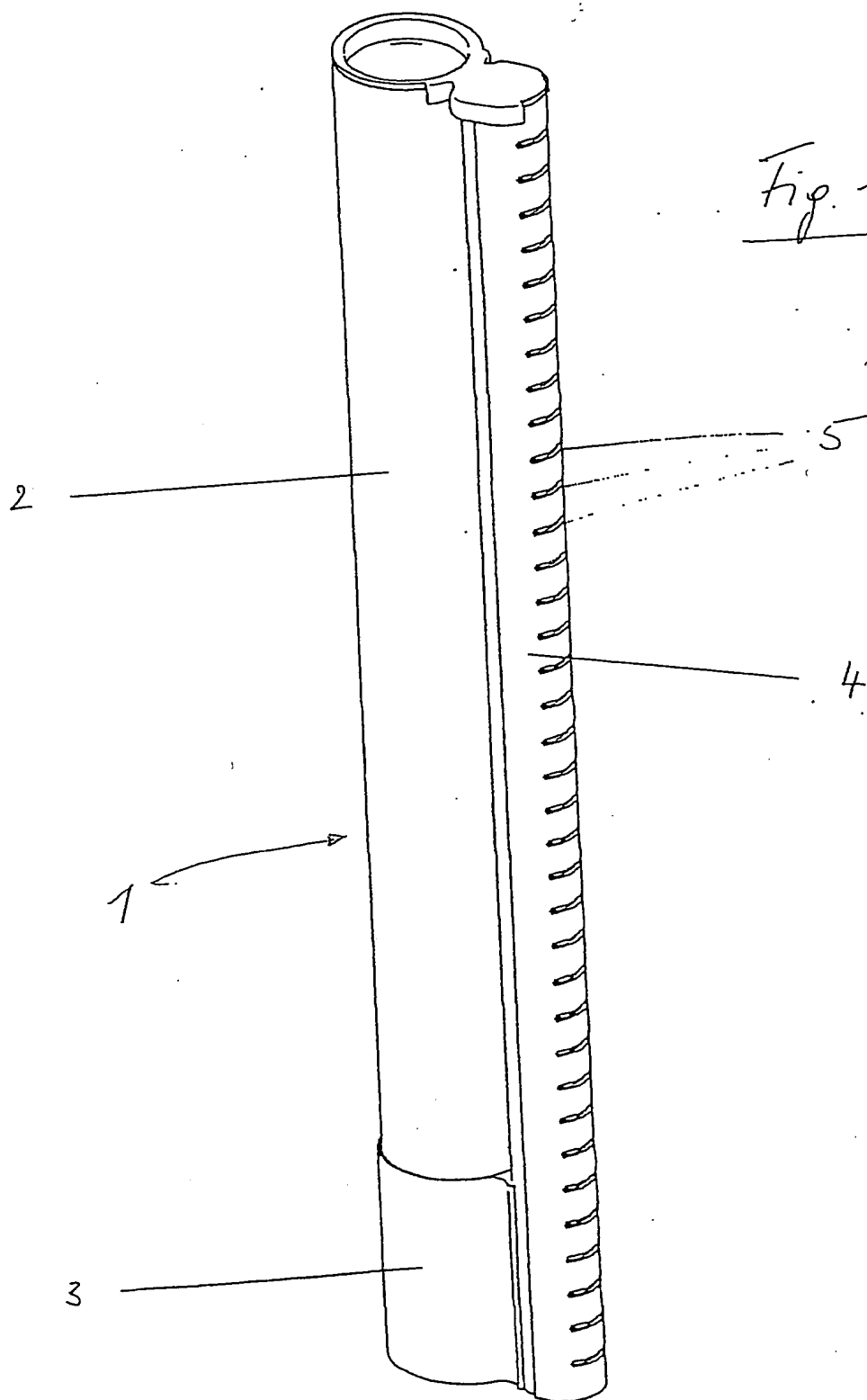
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15. The condenser as claimed in claim 14, **characterized** in that the sieve (31) has an annular edge region (33) which is firmly connected to the wall (34) of the header (10, 12).



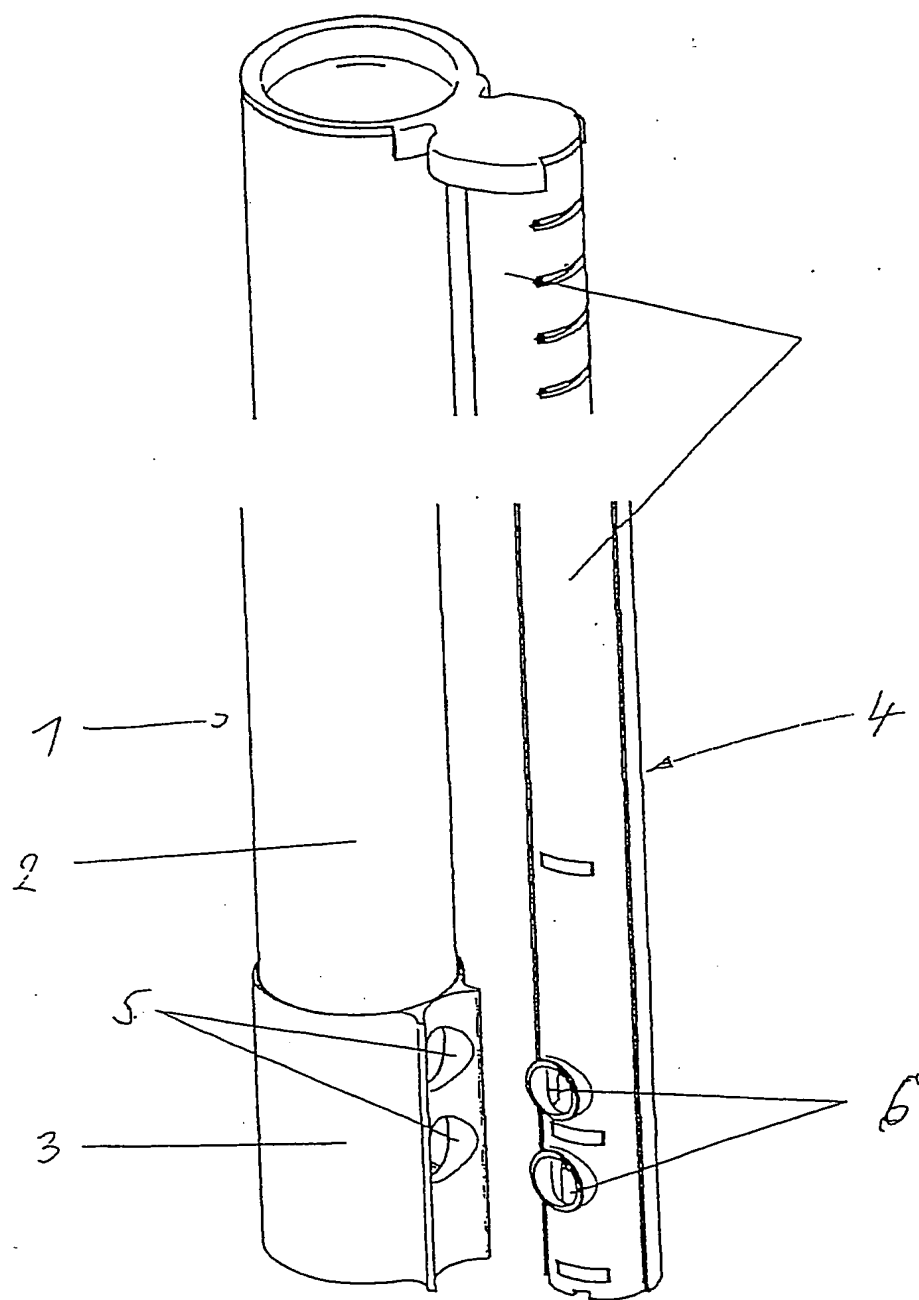


Fig. 2

APPENDIX B

TRANSLATOR'S DECLARATION

I, the below-named translator, certify that I am familiar with both the German and the English language, that I have prepared the attached English translation, and that the English translation is a true, faithful and exact translation of the corresponding German language paper.

I further declare that all statements made in this declaration of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful, false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of legal decisions of any nature based on them.

Oct. 1, 2006
Date

Cornelia Verret
Name: Cornelia VERRET



Certified Mail/Receipt

Received by G-IP
July 10, 2006

Mr. Alain Maurer
8B, rue des fermes
57520 GROSSBLIEDERSTORFF
FRANCE

Intellectual Property, G-IP
Mr. Dr. Grauel
Phone: +49(0)711 896 2891
Fax: +49(0)711 896 3549
andreas.grauel@behrgroup.com
June 27, 2006/FP

Patent Application in USA: 10/508,921

“Not exchangeable dryer”

Inventor: Dr. Gerrit Wölk, Patrick Jung, Sylvain Louis, Alain Maurer, Christian Michels

Our Ref.: 01-B-147 WO/US

Dear Mr. Maurer:

We refer to our previous correspondence regarding the Declaration/Assignment forms for the United States Patent Applications, which we forwarded to you for execution.

Enclosed is another copy of the application documents as well as the Declaration/Assignment forms. We ask you to return the same to us signed and dated. An addressed return envelope is enclosed herewith.

Your signature has to be urgently submitted in the U.S. Patent Office. Accordingly, please return the executed forms to us as soon as possible. Thank you in advance.

Best regards,

BEHR GmbH & Co. KG
Intellectual Property

F. Pilavdzic
(Secretary)



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Herrn
Alain Maurer
8B, rue des fermes
57520 GROSSBLIEDERSTORFF
FRANKREICH

Eingang bei G-IP

10. Juli 2006

Erl.:

Intellectual Property, G-IP
Herr Dr. Grauel
Telefon: +49(0)711 896 2891
Telefax: +49(0)711 896 3549
andreas.grauel@behrgroup.com
27. Juni 2006/FIP

Patentanmeldung in USA: 10/508,921

"Nicht austauschbarer Trockner"

Erfinder: Dr. Gerrit Wölk, Patrick Jung, Sylvain Louis, Alain Maurer, Christian Michels
Unser Zeichen : 01-B-147 WO/US

Sehr geehrter Herr Maurer,

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Vielen Dank im Voraus.

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F. Pilavdzic
(Sekretariat)